

# LINAC L1 SUBSTATION UPGRADE

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## POWER SYSTEMS

# WHY UPGRADE THE L1 SUB STATION

- Reduce the heat in the lower gallery by buying a transformer that has a better heat loss.
  - 80 Deg C rise rather than the present 115 Dec C rise.
- Free this transformer up as a second spare for the site.
  - The high rise has 5 transformers installed, LINAC 3.
  - The site has one spare for the eight operational units because one failed in the high rise years ago.
- This will also free up 480vac breakers that are no longer manufactured. We will then send them out for rework and testing.
- The line side disconnect will also be replaced. The reason for this is the fuse holders are spring contacts that age with the heat and current. Replacing this will allow us to rebuild the disconnect.

# SUB STATION RATING

- 1,500 kVA transformer
  - 13.8kV to 480Y/277V
  - 5.5% impedance
  - 80 deg C rise
- 13.8kV fused input switch.
- Low voltage breakers with modern trip control and instrumentation
  - This allows for better breaker coordination
  - Current issue of breaker designs so we can get spares and repairs as needed
- After this equipment is out we will construct a plan for getting it reworked

# L1 PRESENT SUB STATION



# COST AND SCHEDULE

- Sub Station Quote \$164.7k subject to change due to copper and steel prices. So we put \$180k on the req.
  - Expected procurement process
    - 2 weeks for approvals
    - 4 weeks for bid
    - 2 weeks of holiday.
    - Expect contract by mid end of January
- Manufacturing time expect 7-8 months so parts on hand September.
- Installation estimate 5 days down time
  - Need a generator \$2k/day
  - Need electricians \$1.5k/day
  - Need riggers \$6k total plan for only one day

# WHAT IS NEXT FOR US

- The booster sub stations are very similar so we are completing the specifications for these subs. Same length of lead time and also need a shutdown of one day each to install in the booster.
- Then we will start on the motor control center specification
  - The first one will be in the L1 sub station location so if we can plan for this change out at the same time as the transformer then the impact is reduced.
  - Lead time is 8-10 weeks for manufacture, so it fits in the window of the transformer procurement.
  - 1-2 days of electrician time to install and can be done in parallel with the transformer.
- As part of the PIP I recommended the replacement of the house power transformer for the cross gallery. This is not unique to PIP but would be good for the complex. This transformer failed two years ago and we replaced it with an even older version of the same design.

# WHAT IS NEXT FOR US CONTINUED



Booster House Power



L1 motor control center



Cross Gallery Sub (MCR)